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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,212	04/21/2004	Qiming Li	20.2886	3211

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EXAMINER

WHITTINGTON, KENNETH

ART UNIT PAPER NUMBER

2862

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/709,212

Applicant(s)

LI ET AL.

Examiner

Kenneth J. Whittington

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 40-71 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 10-39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/21/04, 5/17/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☒ Other: IDS 11/10/04, 2/28/05, 12/5/05.

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DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed February 28, 2005 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. The RU998995 reference does not have an explanation or translation. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Gianzero et al. (US 4,980,643), hereinafter Gianzero. Regarding these claims, Gianzero discloses a method for induction logging comprising:

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disposing within a borehole a logging instrument equipped with at least first transmitter and receiver antennas spaced apart by a first distance, at least one of the first antennas having a tilted magnetic dipole with respect to the longitudinal axis of the instrument, the antennas being oriented about the axis of the logging instrument such that the at least one tilted magnetic dipole corresponds to a first azimuthal angle (See Gianzero FIG. 1, transmitter 35 and receivers 40 and 45);

azimuthally-rotating the logging instrument within the borehole; while the logging instrument is rotating, activating the first transmitter antenna to transmit electromagnetic energy into the formation; while the logging instrument is rotating (See col. 5, lines 1-62, note sonde is rotated to provide a matrix in the bedding and is received via the receivers),

directionally measuring the first voltage signals associated with the transmitted electromagnetic energy using the first receiver antenna, as a function of the azimuthal orientation of the logging instrument, so as to determine the azimuthal variation of the measured first voltage signals (See col. 6, line 1 to col. 9, line 60); and

fitting the azimuthal variation of the measured first voltage signals to approximate functions (See col. 9, line 61 to col. 10, line 9).

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Regarding claim 2, the fitting step is executed while the first voltage signals are being measured (See col. 9, line 61 to col. 10, line 9, note that the approximations are done automatically after measurement to find dip).

Regarding claim 3, the fitting is stopped when convergence has been achieved (See col. 9, line 61 to col. 10, line 9).

Regarding claim 4, the activating, measuring, and fitting steps are repeated to execute subsequent acquisition cycles (See col. 1, lines 7-11, note that Gianzero is usable to determine parameters of multiple formations, thus is usable for subsequent acquisition cycles).

Regarding claims 5 and 6, the fitting functions are sinusoids defined by coupling components of the first transmitter antenna's magnetic dipole and first receiver antenna's orientation vectors and the coefficients of the fitting components are functions of earth formation parameters including at least one of resistivity of formation beds, location of the logging instrument, borehole deviation, azimuth angle at the location of the logging instrument, and a combination thereof (See col. 6, line 16 to col. 9, line 60).

Regarding claim 7, the fitting coefficients include constant, sine, cosine, double angle sin and double angle cosine terms that define an iterative fitting algorithm useful for

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determining the azimuthal dependence of the directional measurements (See col. 6, line 16 to col. 9, line 60).

Regarding claim 8, the iterative fitting algorithm is used for selected real-time directional measurements having utility in geosteering (See col. 9, line 61 to col. 10, line 9, note that the equation is fitted automatically. Also note that claim is phrased in terms of an intended use having an intended utility. Because the apparatus of Gianzero discloses the same general features, it can be used for the intended uses and discloses the claim).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gianzero in view of Minerbo et al. (US 6,304,086), hereinafter Minerbo. Regarding this claim, Gianzero teaches the features noted above except for the use of a Fourier

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transform. Minerbo teaches use of a Fourier transform in induction logging applications (See Minerbo col. 5, line 57 to col. 15, line 38). It would have been obvious to use a Fourier transform in the processing of Gianzero. One having ordinary skill in the art would have been motivated to do so to reduce the complexity of equations to a usable form as noted by Minerbo at col. 7, lines 45-49 and further it is well known in the art to use a Fourier transform to derive a set of equations with coefficients representing desired characteristics.

Allowable Subject Matter

Claims 10-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 10-28, the prior art does not show or teach at least one of the first antennas being at an angle to the tool axis, at least one of the second antennas being at an angle to the tool axis, the first transmitter of the second having the same orientation as the second receiver, the first receiver having the same orientation as the second transmitter,

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and fitting the azimuthal variations in the manner as recited in the claims and in combination with the other features of the claims.

Regarding claims 29-39, the prior art does not show or teach the fitting algorithm as recited in the claims and in combination with the other features of the claims.

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art illustrates various induction logging apparatus and methods.

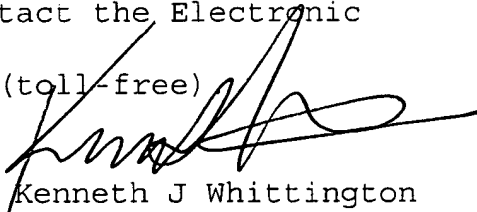
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)



Kenneth J Whittington
Examiner
Art Unit 2862

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